



UNIVERSITY EXAMINATIONS

**EXAMINATION FOR SEPTEMBER/DECEMBER 2021/2022 FOR BACHELOR OF
SCIENCE IN COMPUTER SCIENCE**

COURSE CODE: COURSE UNIT

DATE December 2, 2021

TIME: 2 HOURS

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during examination time.

This is a closed book examination. Text book/Reference books/notes are not permitted.

SPECIAL INSTRUCTIONS:

This examination paper consists Questions in Section A followed by section B.

Answer **Question 1 and any Other Two** questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **Keep ALL bags and caps at the front of the examination room and DO NOT refer to ANY unauthorized material before or during the course of the examination.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. () will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

Section A

Question One (Compulsory) (30 Marks)

- a) Define the Systems Development Lifecycle (SDLC) and Methodologies and Point out differences between them.
(6 Marks)
- b) Discuss why methodologies became necessary and expound the place/significance of methodology philosophies.
(4 Marks)
- c) Clarify the difference between Methods and Methodologies.
(2 Marks)
- d) Outline four important considerations a development/acquisition team need to take into consideration when they are selecting a methodology to use for a project.
(4 Marks)
- e) Describe the Capability Maturity Model (CMM) and illustrate with a diagram.
(4 Marks)
- f) As firms move to the CMM level three, they must adopt a methodology to use for all their systems acquisition/development projects in the organization. Outline four issues that may inform their choice of methodology.
(4 Marks)
- g) Outline the merits and drawbacks of Jackson's Soft Systems Methodology and illustrate with an example.
(6 Marks)

Section B: Answer TWO questions from this section.

Question Two (15 Marks)

As the term for the current government enters the tail end, it is apparent that the president is keen to secure his legacy. With the realization of President Kenyatta's 'big four' agenda having undergone various challenges due partly to politics but chiefly due the COVID-19 pandemic, there is a push to ensure that aspects of universal health are realized by the end of 2022. With the very pivotal role health plays in the wellbeing of the nation, it is hoped that the government will get this right. This is because health has been a challenge for many countries including resource-rich and advanced countries like the US.

Kenya's health problems are compounded by cartels and corruption networks that have taken the sector captive over the years. As we grapple on how to approach this, we are reminded that health is a devolved function and the county governments are therefore in charge of health-care delivery. Policy formulation, major pharmaceutical procurement, and referral hospitals are controlled by the

national government. The health function is heavily funded by donors and development partners (including Global Fund, USAID, Bill and Melinda Foundation, UNICEF, WHO, etc) who all require accountability from the national and county governments.

When it comes to health-care delivery, doctors demand an efficient, comprehensive referral system from the dispensary, through the health centres, the county referral hospitals and onto the national referral hospitals. Public health professionals have also recommended the incorporation of community health extension workers and community health volunteers in the formal health system. The Health Cabinet Secretary is demanding a comprehensive health products procurement, distribution and logistics system (to mitigate against malpractices and fraud during procurements of medicines). Finally, individual hospitals and health-care providers require comprehensive medical records systems that support all their functions.

The national government recognizes the need for health information to inform their policies if they will be effective in delivering health value to the country. For this, some healthcare consultants are recommending an integrated health system that can capture, collate and analyze information from all these stakeholders and players to enable audits and information to enable informed policy analysis, formulation and implementation. This system will need to interface and work with ALL health systems (private and public, health centres, county, national government, etc.) in the country. This has become extremely critical in the light of the COVID-19 pandemic with the attendant challenges. You are part of the team that will design this national health system.

- a) Select a suitable methodology (ies) and critically justify the selection.

(6 Marks)

- b) For the recommended methodology above, give the steps (phases) and techniques the teams will go through during the analysis stage, and illustrate from the narrative above how this will be done.

(9 Marks)

Question Three (15 Marks)

The government of Kenya is in the process of automating all its processes and service delivery in a consolidated online web-based and mobile—based system that is expected to run on Amazon's Infrastructure as a Service (IaaS) Cloud facilities. The team tasked with developing the system is in the process of selecting the methodology to use. As the team considers the methodology to select, advise them on the following:

- a) The criteria for assessing the methodologies.

(6 Marks)

- b) Outline how they will go about the methodology selection process.

(9 Marks)

Question Four (15 Marks)

Select four Information Systems Development Methodologies and compare them according to their features/characteristics.

(15 Marks)

Question 5 (15 Marks)

a) Outline the ethical issues that arise from designing, developing and implementing Information Systems.

(5 Marks)

b) Discuss whether/how structured methodologies address ethical issues of systems developed using them.

(5 Marks)

c) Give examples of two methodologies that have the potential to address ethical issues and outline how they can address them.

(5 Marks)